REMARKS/ARGUMENTS

Reconsideration and allowance of the instant application are respectfully requested. Claims 1, 2, 4-6, 8-12, 14-16, and 18-20 remain in this application. Claims 3, 7, 13 and 17 were previously canceled. Claims 1 and 6 have been amended to emphasize that the aluminum alloy is useful for fluxless brazing under nitrogen. This characteristic is supported by paragraph [0017] of the specification of the application as published. Independent claim 11 also now recites fluxless brazing under nitrogen.

Claims 1-2, 4-6, 8-12 and 14-16 stand rejected under 35 USC 103(A) as unpatentable over Ueda (JP 200303132) in view of Shinji (JP 08-120389 English Machine Translation).

The composition and added elements to the core and the brazing alloy (cladding) of the instant claims are for a specific purpose not disclosed or suggested in any of the cited documents. As explained in the specification, the purpose of the present invention is to enable manufacturing of brazed aluminum alloy parts by fluxless brazing under nitrogen to proceed under good economic conditions when compared to vacuum brazing especially. In particular, it is possible to use the same equipment as that used for brazing with flux under a controlled atmosphere.

The present invention modifies the composition of a core alloy so that brazing can be done without any deposition, under a standard nitrogen controlled atmosphere, and without changing brazing installations present at manufacturing plants. Surprisingly, the addition of some elements into the core such as yttrium with a content of about 0.05% or bismuth with a content of about 0.15% can provide a very satisfactory brazed joint quality for fluxless brazing under a nitrogen atmosphere.

In contrast, Ueda is devoted to vacuum brazing (see page 1 of 9, paragraph [0002]) which is a different brazing process when compared to brazing under a nitrogen atmosphere, and with completely different requirements in terms of composition and process parameters. The possible addition of other elements to the brazing alloy, as asserted by the Office Action, specifically Mg, is well known in the vacuum brazing process and even recited in the present application (see "state of the art": "Vacuum brazing is another older technique that is still used, particularly in North America. This process makes it necessary to use cladding containing magnesium; this element is segregated on the surface and vaporizes in the vacuum, and provides the means of capturing residual oxygen traces. It thus prevents the

oxide layer, initially broken by differential expansion, from reforming. No flux is necessary, but vacuum creation installations are very expensive and the associated maintenance costs are very high. Existing lines have gradually been abandoned to be replaced by Nocolok® lines, for economic reasons.") Thus an alloy for vacuum brazing requires different considerations than an alloy for fluxless brazing under nitrogen as in the claimed invention. That is the brazing under vacuum is not the same as brazing under a controlled nitrogen atmosphere.

Moreover, the Ueda core composition (with 3003 + Y cited in two examples) associated to a clad is not aimed at having any influence on the type of brazing process but instead is added to improve the resistance to erosion by the refreshing fluid circulating in the heat exchanger.

One skilled in the art, searching for a solution to avoid both the use of a flux and a vacuum in the brazing process, and to keep the same conditions and equipments as when brazing with flux under controlled atmosphere, would not have selected the same core as the one disclosed by Ueda, which core is associated with different cladding alloys, knowing that interactions between the clad and the core and the influences of their specific associated compositions is crucial when brazing and that Ueda is focused for the erosion/corrosion behavior during vacuum brazing and not brazing under a nitrogen atmosphere.

The Office Action admits that Ueda does not teach additives such as Be in the brazing alloy but considers that Ueda does teach that "other elements" such as Mg may be added to the brazing alloy of Ueda. Ueda discloses on page 2 of 9 of the specification that the brazing filler contains Si or Ge. On page 3 of 9, lines 3-5, Ueda notes that any *other elements present cannot confer any new effect* on the invention. In fact, the only additional element recited that may be present in the brazing filler is Mg. See page 6 of 9, line 4, wherein Ueda discloses that "the wax material which consists of Mg alloys aluminum-10% Si-1.2% to both sides…"

Claims 1, 6, and 11 recite that the brazing alloy contains at least one element for modifying the surface tension of the alloy, the element selected from the group consisting of Ag, Be, Bi, Ce, La, Pb, Pd, Sb, and mischmetal. The Office Action considers the property that Bi modifies surface tension as an inherent property. Thus, the Office Action appears to agree that Bi would confer a new effect on the brazing alloy. Hence, one skilled in the art would not have modified Ueda to include Bi.

As noted above, Ueda is very specific as far as what can be added to its brazing alloy

in order to obtain the desired erosion/corrosion control and does not refer to any of the listed elements of the instant claims, which are clearly aimed at brazing under a controlled nitrogen atmosphere.

Thus, the claimed elements are included to modify the surface tension and allow for a fluxless brazing under a controlled nitrogen atmosphere, whereas Ueda specifically states that elements cannot be added which confer any new effect. Hence Ueda teaches away from elements that would change the effect of the invention such as modifying the surface tension. One skilled in the art would not have modified Ueda to include any element that would confer any new effect and thus would not have modified Ueda to include any of the listed elements.

The Office Action included Shinji as teaching a brazing alloy that contains Al-Si-Mg-Bi. As discussed above, the claimed listed elements, including Bi, modify the surface tension of the brazing alloy. Hence, one skilled in the art would not have modified Ueda in view of Shinji.

Further, Shinji does not teach or suggest fluxless brazing under a controlled atmosphere and especially a nitrogen atmosphere. Similar to Ueda, the process used for the examples (see page 8/10) is vacuum brazing. The purpose of the core (an Al-Cu type alloy) and clad compositions is the intergranular corrosion resistance facing "working fluids" circulating in the heat exchanger (see page 1 of 10, [0002], page 2, [0004]: "making clad material work as a sacrificial anode") where the interaction between clad and core is crucial (see [0007]: "adding a little Bi into an Al-Cu system alloy" and [0018] "the $CuAl_2$ deposits easily with the priority portion/of a grain boundary to the part of Bi").

Shinji is not concerned with the brazing process or improvements to allow for brazing under a controlled atmosphere, namely of nitrogen, as in the claimed invention. When the clad alloy cited (AlSiMgBi) does include Bi, it is associated to Mg in the same way as above to improve vacuum brazing only. Once again, it is not at all the same context as in the claimed invention, and there is no reason at all for the one skilled in the art to adopt such a cladding alloy for a different core (such as the one of Ueda) and with a fully different purpose.

Specifically, the Shinji core is an Al-Cu alloy having greater than 1.5% Cu. See Table 1 for examples of core materials and claim 1 which identifies the amount of Cu in the core. (Note the core is different from the brazing alloy, such as identified in claim 3 and

Table 3, which has less Cu.) The instant claims require less than 1.0% Cu in the aluminum core. Hence Shinji does not teach or suggest a brazing alloy coated on the aluminum core as claimed. Moreover, Shinji does not teach or suggest that modifying a brazing alloy suitable for vacuum brazing would be suitable for fluxless brazing under nitrogen as each type of brazing requires different considerations.

There is no teaching or suggestion in either Ueda or Shinji of using element selected from the group consisting of Ag, Be, Bi, Ce, La, Pb, Pd, Sb, and mischmetal in a brazing alloy for use with the aluminum core as claimed. Thus Ueda and Shinji do not teach or suggest claim 1 or claims 6 and 11 for the same reasons. Withdrawal of this rejection is requested.

Claims 18-20 stand rejected under 35 USC 103(a) as unpatentable over Ueda in view of Shinji and Baba et al. (JP 58-040495).

Ueda and Shinji do not teach or suggest independent claims 1, 6, and 11 for the reasons discussed above. Baba does not remedy the defect of Ueda and Shinji.

Baba is directed to improving the corrosion behavior by creating a sacrificial anodic effect for a fin material by adding Sn. The fin material contains a core composed of an Al-Sn-Mn-Cu alloy with addition of 0.2-1.5 Zn. Baba does not utilize this addition of Bi, and moreover associated to Zn, Sn and Mn, in order to promote the suppression of a flux when brazing under controlled nitrogen atmosphere, but in order to create an anodic sacrificial effect. The purpose of Baba is thus very different than that of the instant claims. As a consequence, in contrast to the conclusion in the Office Action, there is no teaching to add the Bi element as taught by Baba in order to promote the suppression of a flux when brazing under nitrogen. Hence Ueda in view of Shinji and Baba does not teach or suggest the instant claims. Withdrawal of this rejection is requested.

CONCLUSION

If any further fees are required or if an overpayment is made, the Commissioner is authorized to debit or credit our Deposit Account No. 19-0733, accordingly.

All rejections having been addressed, applicants respectfully submit that the instant application is in condition for allowance, and respectfully solicit prompt notification of the same.

Respectfully submitted,

/Susan A. Wolffe/

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